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Claims

1. Water spraying system, especially for the humidification of the intake air of a piston engine to reduce nitrogen oxide emissions, said system
5 comprising at least one nozzle (9, 10, 11, 12, 13) for spraying an aqueous liquid mist into the air intake duct (2) and means for conveying the liquid to be sprayed to the nozzle, characterized in that the system comprises means for accomplishing the injection of a spray of aqueous liquid mist with an adjustable temperature to at least one point
10 in the air intake duct (2) depending on the load and/or speed of rotation and/or temperature of the engine.
2. Water spraying system according to claim 1, characterized in that the amount of aqueous liquid to be sprayed into the air intake duct
15 (2) is distributed in the system to several nozzles (9, 10, 11, 12, 13).
3. Water spraying system according to claim 1 or 2, characterized in that the amount of aqueous liquid to be sprayed is distributed in the air intake duct (2) over a larger area to achieve an optimal vaporiza-
20 tion, preferably to points with a high temperature and/or air flow or to their vicinity.
4. Water spraying system according to any one of claims 1 - 3, characterized in that the number of nozzles (9, 10, 11, 12, 13) in the
25 system is adapted according to the required amount of liquid to be sprayed.
5. System according any one of claims 1 - 4, characterized in that the point of injection and/or direction of injection of the spray of
30 liquid mist is adapted according to the required amount of aqueous liquid to be sprayed.
6. System according any one of claims 1 - 5, characterized in that the system comprises nozzles (9, 10, 11, 12, 13) having different
35 properties, the number and/or type of nozzles spraying being varied according to the amount of liquid required.

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7. System according any one of claims 1 - 6, characterized in that the several nozzles (9 - 13) in the system are arranged on the same mounting frame (6, 7).

5 8. System according any one of claims 1 - 7, characterized in that the system comprises a regulating apparatus, by means of which the injection action of at least some of the nozzles (9 - 13) can be controlled.

10 9. System according any one of claims 1 - 8, characterized in that the system comprises at least one valve element (13, 14), by means of which the liquid flow passage leading to one of the nozzles (9 - 13) is adjusted and/or opened/closed.

15 10. System according any one of claims 1 - 9, characterized in that the system comprises a regulating system, by means of which the pressure in at least one supply pipe (17) leading to the nozzles is kept at least nearly constant or at a predetermined level independently of the output of the pump.

20 11. System according any one of claims 1 - 10, characterized in that the system comprises an output regulating pump unit, by means of which the pressure is regulated by pressure control so that the pressure in at least one supply pipe (17) leading to a nozzle is constant.

25 12. System according any one of claims 1 - 10, characterized in that the system comprises a control system comprising a constant-output pump and controlling the pressure by means of a valve system to maintain a constant pressure in at least one supply pipe leading to a
30 nozzle.

13. System according any one of claims 1 - 12, characterized in that the system further comprises a system for cleaning the nozzles and/or keeping the nozzles clean.

35 14. System according any one of claims 1 - 13, characterized in that the pressure in the liquid supply piping is 10 - 300 bar.

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15. System according any one of claims 1 – 14, characterized in that the droplet size of the water mist is typically below 200 micrometers.

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16. System according any one of claims 1 – 15, characterized in that a second pressure medium, typically a gas, preferably air, is supplied to at least one nozzle.

10 17. System according any one of claims 1 – 16, characterized in that the apparatus comprises means for controlling the temperature of the liquid to be injected.

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